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some such original tendency or aim, evolution would never have reached its present culmination in man." He quotes Boveri that "there is too much intelligence in nature for any purely mechanical theory to be possible." It is curious that these authors do not perceive that the sensation of protoplasm, (consciousness), furnishes the basis for the exhibition of the intelligence which they observe, and which has itself undergone evolution coincidentally with the organism. Both orthodox and heterodox evolutionists (theologically speaking) seem equally slow to adopt this view.

Prof. Tyler's book is eminently moderate and reasonable, and will introduce evolution to a large class of readers in an agreeable form.

**Cope on the Factors of Organic Evolution.**<sup>3</sup>—This book is divided into three parts: I, The nature of variation; II, The causes of variation; III, The inheritance of variation. In the first part it is endeavored to show that variation is not promiscuous or multifarious, but pursues direct courses towards definite ends. This is done by presenting the variations of existing species as to color and structure, and by an examination of the series presented by the forms of vertebrate life in past geologic ages. The latter presentation is a general phylogeny of the vertebrata, with special sections on that of the horse and that of man. The second part is divided into chapters which deal with the physical energies as causes of variation, and the effects of molar motion as seen in variation. These methods of evolution are termed respectively physiogenesis and kinetogenesis. Especial attention is given to kinetogenesis in connection with the phylogeny of vertebrates, since it is in these two fields that most of the original work of the author has been done. The author has demonstrated that the primary cause which has moulded the vertebrate skeleton is molar motion. In the third part, the inheritance of the characters so produced is shown to be the rule, thus demonstrating the inheritance of acquired characters. Theories of inheritance are discussed, and that one which asserts the transmission of energies to the germ plasma is defended. These energies are believed to be the results of a composition between inherited and acquired energies, the whole of them being referred to a class distinct from the inorganic energies, which he has named Bathmic. The last chapter in this part is devoted to a consideration of the relation of consciousness to movements, and hence as a cause

<sup>3</sup> The Primary Factors of Organic Evolution, by E. D. Cope, Professor of Zoology and Comparative Anatomy in the University of Pennsylvania. Chicago: Open Court Pub. Co., Feb., 1896, \$2.00.

of progressive evolution. The author holds that sensation is a cause of effects which would not appear in its absence, and that its presence conditions progressive evolution. The author holds this to be proven not only by the direct effect of consciousness as observed, but also on the other ground that there is no sufficiency in the inorganic and unconscious organic energies to effect progressive evolution. This is because the well-known tendency of the latter is to the integration of matter and the dissipation of energy, which leads always away from vital phenomena. The author believes the entire vegetable kingdom to be degenerate, its vitality being the expression of automatic energy which derived its self-sustaining character from ancestors endowed with sensation which occupied a position between animals and plants. The Mycetozoa he believes to be existing near relatives of these types.

The book is illustrated by 120 plates and cuts. One of these illustrative of homoplasy, we extract from the chapter on kinetogenesis, with the following explanatory remarks :

“Before reviewing the subject, I cite what is the most remarkable example of homoplasy in the Mammalia which has yet come to the knowledge of paleontologists. Ameghino has discovered in the cenozoic formations of Argentina a group of Ungulata which he calls the *Litopterna*, and which I regard as a suborder of the *Taxeopoda*, allied to the *Condylarthra* (p. 128). Ameghino placed the group under the *Perissodactyla*, but the tarsus and carpus are of a totally different character, and indicate an origin from the *Condylarthra* quite independent of that division. The carpal and tarsal bones are in linear series, or if they may overlap, it is in a direction the opposite of that which characterizes the order *Diplarthra* (= *Perissodactyla* and *Artiodactyla*). But the *Litopterna* present a most remarkable parallelism to the *Perissodactyla* in the characters of both the feet and the dentition. No genus is known as yet which possesses more than three toes before and behind, and these are of equal length (*Macrauchenia* Owen). In this genus the teeth are not primitive, but are much modified. The most primitive dentition is seen in the genus *Proterotherium* (Ameghino) where the superior molars are tritubercular, as in many *Condylanthra*. In this genus (Pl. X, fig. A) there are three toes, but the lateral ones are reduced, about as in the equine genus *Anchitherium* (p. 148). In the next genus, *Diadiaphorus* Amegh., the superior molars are quadritubercular and crested, while the lateral toes are reduced still more, being quite rudimental (figs. B C), as in the equine genera *Hippotherium* and *Prothippus*. The superior molars have not progressed so far as in these genera, but are not very different from those of

Anchitherium. In the third and last type (*Thoatherium* Amegh.) the lateral digits have disappeared from both fore and hind feet (figs. C D), so that the condition is that of the genus *Equus* (fig. 81), but the splints in the *Thoatherium crepidatum* Amegh. are even more reduced in the known species of horse. The superior molars have not assumed the pattern of the genus *Equus*, but resemble rather those of *Macrauchenia*, and could have been easily derived from those of *Diadiaphorus*.

Here we have a serial reduction of the lateral digits and their connections with the leg, and increase in the proportions of the middle digit and corresponding increases in the proximal connections, exactly similar to that which took place in the horse line, in a different order of Mammalia."

The publishers have done their work well, and are especially to be commended for having made the book of a convenient size to be carried in the pocket or satchel.

**The Child and Childhood in Folk-Thought.**—(The Child in Primitive Culture); by A. F. Chamberlain; New York, Macmillan & Co., and London, 1896. Pp. x and 464; with bibliography and three indexes; price \$3.

Dr. Chamberlain's work is not, as its chief title might lead one to suppose, a mere collection of folk-lore about the child. It is rather an attempt by this means to study the position of the child in primitive society. The author has brought together a great mass of material from every hand, and arranged it systematically under appropriate headings; as a result we find every phase and aspect of childhood represented in his book.

The opening chapters, on the Lore of Motherhood and Fatherhood, have in some places only a remote bearing upon the main topic, but they may be regarded in the light of a general introduction. Following these are a number of chapters which aim to show the attitude of society toward the child; folk-lore on the soul of the child, legends connecting children with animals or plants, stock answers of the adult to the child's questions, superstitions concerning children, etc., together with stories of education and training among uncultured races. A large part of the work deals with the influence of the child upon society—the effect of child-language in modifying adult language; the child's position in many tribes as oracle, judge, physician, or priest, etc. The final chapters are a selection of popular proverbs and sayings bearing upon childhood, from the literature of various races, cultured as well as